A REMARKABLE SPECIMEN OF CALLIXYLON NEWBERRYI (DAWSON) ELKINS ET WIELAND, FROM THE OHIO SHALE.*

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This spring while on a field trip with some students to examine the basal Ohio shale as exposed along the Olentangy River north of Worthington, Ohio, at the locality known as High Banks, we made a rather abundant collection of plant impressions. These impressions are all referable to *Callixylon Newberryi* (Dawson) Elkins et Wieland as interpreted by Arnold of Michigan.

For the most part they are impressions of short pieces, well carbonized and in general not showing any vertical ribs, but with well defined cross marks or so-called nodal lines. These smaller pieces average 8 to 10 inches long and 1 to 3 inches wide. The remaining piece is larger and branched and is worthy of describing and figuring, as it differs in several ways from the previously described material referred to the species.

The impression herein to be described may be interpreted as a stem with a long branch from it. Such is probably the case, but if so it is difficult to account for the fact that while the branch has a width of about 5 cm. the main stem is only about 3.2 mm. wide. In this connection Professor E. W. Berry suggests that it may be due to the possibility that the stem was more solid wood and the branch more pith, hence upon compression the branch tended to spread out, whereas the more woody material was compressed without so much spreading. The dissimilarity of size could also be interpreted as a rhizome and an erect stem. This interpretation is also unsatisfactory because from the structural material *Callixylon* is related to *Cordiates* and should not have a rhizome. Also, the erect stem should come off more at a right angle than it does. No other interpretation presents itself unless we consider that the two pieces are not in organic union. That they are not in organic

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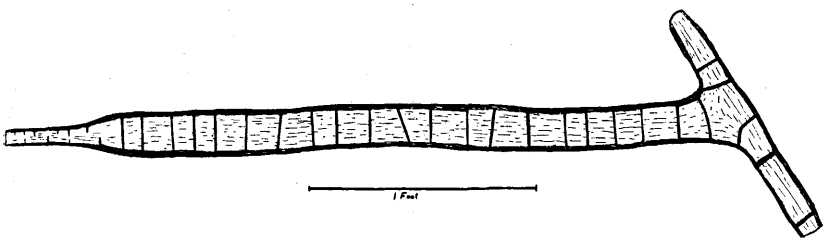
union does not seem to be the case, as the impressions show every sign of being one and the same piece. In this case I think we must accept the first interpretation, that it is a short stem with a long branch which, due to the mode of preservation, was spread wider than the main branch.

Another unusual factor is the angle of branch to stem. Arnold notes the angle of branching as about 45°. In this specimen the angle is at least 60° and there is no evidence of crushing below the branch or spreading above, such as should be found if the branch had been mechanically bent outward; neither does the rest of the branch bend in such a way as to support the supposition that it had been bent away from the stem.

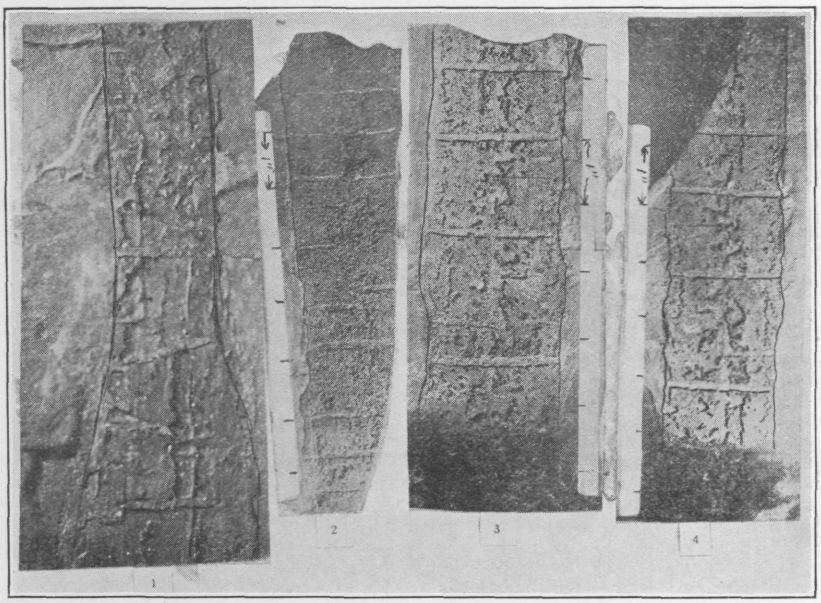


A third new factor is the decided sudden reduction in width of the branch near the outer end. The branch throughout most of its length averages 5 cm. broad and about 12 cm. from the outer end it decreases suddenly in breadth to about 2.3 cm. On both sides of this abrupt decrease the margins of the specimen are approximately parallel. The reduction in width occurs in about 5 cm. and below the reduction the nodal lines are heavier and farther apart and almost always complete. Above this point they are much less prominent and more indefinite.

Professor A. C. Seward, of Cambridge, who kindly examined part of this specimen, referred it to *Callixylon*, but stated that the so-called nodal lines were due to shrinkage cracks in preservation. Such they may be, but in this connection I raise the question: If they are shrinkage cracks should they not be filled with the matrix in which the fossil is imbedded? In this one specimen these pronounced lines are composed of denser coaly material than the rest of the stem.

Doctor Lewis H. Tiffany, of the Botany Department of Ohio State University, would refer it to the marine algae, and Mr. L. C. Li, a student of algae, would refer it to the red algae.

In this connection it may be noted that the modern red algae, although very much smaller than the specimen in question, exhibit very similar tendencies, i. e., branches may be broader than the stem and may taper abruptly near the terminals, and they also tend to produce nodal elements. It is faintly possible that this fossil represents a new fossil algae and not *Callixylon*. Petrified material exhibiting the definite nodal elements is needed to prove it new, however.



It is of interest to note in connection with these specimens that they were collected within 3 feet of the bottom of the Ohio shale where its (Ohio shale) contact with the Olentangy shale could clearly be seen.

The specimen may be described as follows:

Callixylon Newberryi (Dawson) Elkins et Wieland.

1859. *Calamites inornatus* Dawson. Jour. Geol. Soc. London, Vol. XVIII, 1861–62, p. 310, pl. XVII, fig. 56.

1931. *Callixylon Newberryi* Arnold. Contributions Mus. Paleon. Univ. Michigan, Vol. III, No. 12, pp. 207–232.

Impression of stem and branch. Branch about 1 mm. long and averaging 5 cm. in width except at outer end where it abruptly tapers to a width of about 2.3 cm. Stem smaller

than branch, about 34 cm. long and averaging 3.2 cm. wide. Angle of branch to stem about 60°. There are 5 very definite "nodal lines" on the stem and 21 on the branch, exclusive of the narrower part which has several rather indefinite ones. Indications of vertical ribbing very slight, although other specimens show it. On the stem the "internodes" vary in length from 3 cm. to 10 cm. On the branch they are about 4 cm. long.

Occurrence: Basal Ohio shale, High Banks, Franklin County, Ohio.

Figured specimens in collection at the Geological Museum, Ohio State University, Columbus, Ohio. Reversal in collection at Johns Hopkins University, Baltimore, Maryland.

The Insect Menace.

As Doctor Howard has stated, this book is written in order to arouse the general public to an appreciation of the real menace of the insect to humanity. This he has attempted to accomplish by presenting some very important and especially interesting material from various phases of insect life and by citing some outstanding economic problems. The early view point of the public toward the man who was interested in insect life merely as a collector is shown by the treatment and consideration he received from people in all walks of life. Only in recent years has an entomologist been looked upon as a benefactor to society. The great development in the work upon economic insects has been accomplished within the past fifty-five years. Insects have existed about forty million years, while man has been present about four hundred thousand years. Man may prove to be an unsuccessful experiment in nature, but the insect has persisted and has demonstrated that it is a success as a biologic form. Therefore, the fight between man and the insect is very much in favor of the latter because of its successful establishment and diversity of forms. During this period of forty million years insects have become adapted and selected in many ways. They have developed in such a way as to be better concealed in nature and their ability to multiply enormously and a large number of species have been established. The estimate is now made at probably four million species. Also they have advantages such as chitinous exoskeleton and other structural adaptations. All types of foods have been used by different types of insects and the physiology has become greatly changed in different types. Many special adaptations have occurred too, such conditions as subterranean, aquatic and various types of habitats. Man has caused the artificial spread and unusual increase of insects in many regions of the world. Rapid transportation by automobile, the airplane and the dirigible have added new and more rapid means of spread, which have increased the effectiveness of the insect pest. Insects are discussed in their relationships to the carrying of disease organisms in the case of man, domestic animals and plants. The forms which are beneficial are also discussed as producers of commercial products, or as assisting man in the production of commercial products. But Doctor Howard has discussed those of beneficial status especially as they occur as parasites of injurious insects. Control of economic insects in its modern phases is also presented, especially from the fields of mechanical and chemical measures, the changing of farm practices and the use of quarantine methods. For the student or the average citizen who is not acquainted with these problems this should be a very interesting and enlightening account of the role of the insect in its relationship to the life and activities of man.—D. M. DeLong.

The Insect Menace, by L. O. Howard, Ph. D., LL. D. xv + 347 pp. New York, London, The Century Co., 1932. $3.50.